REMARKS

Reconsideration of the application in view of the following remarks is respectfully requested.

Claims 1-18 are pending in the application with Claims 1, 4, 7, 11, 15 and 17 being independent claims. The Examiner objected to Claims 2, 3, 5-6, 9, 10, 13 and 14 because of some informalities. The Examiner has rejected Claims 1-18 under 35 U.S.C. §101 because the claims are not directed to a practical application of the idea. The Examiner has further rejected Claim 1 as being unpatentable over Onggosanusi et al. (U.S. Publication No. 2003/0016640) in view of Kim et al. (US Pub-2002/0172184). The Examiner then rejects Claims 1-18 under 35 USC § 103 (a) as being unpatentable over Kim et al. (US Pub-2002/0172184) in view of Yoshida et al. (US 7,006,429).

In reviewing the Office Action, the Applicant notes that the Examiner refers to column 8, lines 13-19 of Kim in the rejection of Claim 1 specifically referring to the limitation, which begins with "a first encoder for receiving w/2 parallel data streams..." Given that Kim is a publication, which is formatted by paragraph numbering, the Applicant could not locate the passage.

Kim discloses an OFDM communication system and method for improving frequency utilization efficiency. Kim further discloses a method for detecting a selected sub-channel with minimized PAPR using a plurality of scrambling codes at a receiver, without transmitting separate supplemental information at a transmitter in the OFDM system. See Abstract and paragraph 0050.

Regarding the objection to Claims 2-3, 5-6, 9-10, 13 and 14, in reply to the Examiner's assertion, the subscripts have been enlarged. Therefore, withdrawal of the objection is respectfully requested.

Regarding the §101 rejection of independent Claims 1, 4, 7, 11, 15 and 17, the Applicant respectfully submits that the Examiner is incorrect in view of the following remarks. Claims 1-18 relate to the method for transmitting and receiving data in an OFDM communication system. In particular, independent claims 1, 4, 7 and 11 are directed to a transmitting apparatus, including an encoder performing block coding in the OFDM communication system, and independent claims 15 and 17 in turn are directed to a receiving apparatus corresponding to independent claims 7 and 11 that claim transmitting data. Claims 1, 4, 7 and 11 recite that the parallel data and an **operator** are inputted and block coded, so that symbols outputted from encoders are sequences complementary to each other, and PAPR of the output symbols, which are sequences complementary to each other, is minimized.

Accordingly, since Claims 1-14 in the present invention include a practical application, and Claims 15-18 directed to the receiving apparatus corresponding to Claims 7-11 for the transmitting apparatus further include a practical application, it is believed that the rejection of the Examiner under 35 U.S.C. §101 is incorrect.

Regarding the rejection of Claim 1, the Examiner asserts that Claim 1 of the present invention is obvious over the feature of "encoding data inputted parallel from a plurality of encoders" as disclosed by Onggosanusi (US 2003/0016640) and the feature of "reducing PAPR by performing IFFT to parallel data by scrambling transmission data using scrambling code (complementary code), calculating PAPR of the IFFT-performed data, selecting and transmitting the data having the minimum PAPR" in view of Kim (US 2002/0172184).

The feature of encoding data using a plurality of encoders in Onggosanusi and the feature of reducing PAPR by using the scrambling code, i.e. the codes which are the sequences complementary to each other, are similar to the object and effect of the present invention. However, Kim and Yoshida (US 7,006,429) do not disclose the main technical feature of generating an **operator** by using parallel input data, automatically forming the relationship of the complementary sequence between the data outputted from the encoders if the **operator** and the input data are encoded by a plurality of encoders, that the data outputted

from each encoder has the minimum PAPR, and transmitting the data having the minimum PAPR. Accordingly, the cited references fail to render the present invention obvious.

Particularly, in comparison with the present invention Kim generates scrambling codes, which are the sequences complementary to each other, multiplexes the generated scrambling codes with all parallel data inputted by IFFT to make the complementary sequence, and performs IFFT, calculates PAPR of the IFFT-performed data, selects and transmits the data having the minimum PAPR.

In contrast, the present invention generates an **operator** by using parallel input data, and if the input data and the **operator** are encoded by a plurality of encoders, the encoded data are in the relationship of the complementary sequences, and the encoded data have the minimum PAPR. Then, the data having the minimum PAPR, i.e. the encoded data, undergo IFFT and are transmitted.

In furtherance of the above, Kim multiplexes the predetermined scrambling code to all parallel data to be in the relationship of the complementary sequence, but the present invention generates the **operator** using input data and encodes the input data and the **operator** to enable the encoded data to be in the relationship of the complementary sequences. Further, Kim reduces PAPR by Inverse-Fast-Fourier-transforming the data in the relationship of the complementary sequences, calculates PAPR of the IFFT-performed data, selects and transmits the data having the minimum PAPR, but the present invention, if the encoded data in the relationship of the complementary sequences undergo IFFT, automatically transmits data having the minimum PAPR.

As mentioned above, the construction of the present invention is clearly different from that of Kim. Specifically, since the present invention does not include the construction of generating the scrambling code, multiplexing the scrambled code with the parallel data, calculating PAPR and selecting data having the minimum PAPR in Kim, the present invention is far less complicated than Kim.

Accordingly, because the main technical feature of the present invention is not disclosed anywhere in Onggosanusi and Kim combined or alone, the present invention is not rendered obvious. Thus, it is respectfully submitted that the rejection of Claim 1 is incorrect.

Regarding the rejection of Claims 1-18 under 35 U.S.C. 103(a), the Examiner asserts that claims 1-18 of the present invention are obvious over the feature of "encoding data inputted parallel from a plurality of encoders" disclosed by Kim (US 2002/0172184) in view of the feature "reducing PAPR by performing IFFT by scrambling transmission data using scrambling code (complementary code) to parallel data, calculating PAPR of the IFFT-performed data, selecting and transmitting the data having the minimum PAPR" disclosed by Yoshida (US 7,006,429).

The feature of encoding data using a plurality of encoders in Kim and the feature of reducing PAPR by using the scrambling code, i.e. the codes which are in the relationship of complementary sequences, are similar to the object and effect of the present invention. However, the combination of Kim and Yoshida does not disclose the main technical feature of the present invention: "generates an **operator** by using parallel input data, automatically forming the relationship of the complementary sequences between the data outputted from each encoders if the **operator** and input data are encoded by a plurality of encoders, and that the output data of each encoder has minimum PAPR, and transmitting the data having the minimum PAPR." Accordingly, the cited references fail to render the present invention obvious

Particularly, in comparison with the present invention, Kim generates scrambling codes which are the sequences complementary to each other, multiplexes the generated scrambling codes with all parallel data inputted by IFFT to make the complementary sequence and performs IFFT, calculates PAPR of the IFFT-performed data, selects and transmits the data having the minimum PAPR. However, the present invention generates an **operator** by using parallel input data, and if the input data and the **operator** are encoded by a plurality of encoders, the encoded data are in the relationship of the complementary sequences, and the encoded data have the minimum PAPR. Then, the data having the minimum PAPR, i.e., the encoded data undergo IFFT and are transmitted.

As mentioned above, Kim multiplexes the predetermined scrambling code to all parallel data to be in the relationship of the complementary sequence, but the present invention generates the **operator** using input data, and encodes the input data and the

operator to enable the encoded data to be in the relationship of the complementary sequences. Furthermore, Kim reduces PAPR by Inverse-Fast-Fourier-transforming the data in the relationship of the complementary sequences, calculates PAPR of the IFFT-performed data, selects and transmits the data having the minimum PAPR, but the present invention, if the encoded data in the relationship of the complementary sequences undergo IFFT, automatically transmits data having the minimum PAPR. As mentioned above, the construction of the present invention is clearly different from that of Kim. Specifically, since the present invention does not include the construction of generating the scrambling code, multiplexing the scramble code with the parallel data, calculating PAPR and selecting data having the minimum PAPR in Kim, the present invention is far less complicated than Kim.

Accordingly, because the main technical feature of the present invention is not disclosed anywhere in Kim and Yoshida alone or combined, the present invention is not rendered obvious. Thus, it is respectfully submitted that the rejection of Claim 1 is incorrect.

Regarding Claims 15-18, the Examiner insists that Claims 15-18 are obvious over the feature of decoding the FFT-performed data by a plurality of decoders recited by Yoshida in view of the feature "extracting and eliminating a scrambling code in the received data by the scrambling code (complementary code), and then demodulating and receiving the data" taught by Kim.

The feature of decoding the data using a plurality of decoders in Yoshida and the feature of reducing PAPR and receiving the transmitted data by eliminating the scrambling code, i.e. the codes in the relationship of the complementary sequences, are similar to the object and the effect of the present invention. However, Kim and Yoshida do not disclose the main technical feature of identifying the **operator** bit in data outputted by decoding, eliminating the identified **operator** bit, demodulating and receiving the data in the present invention." Accordingly, the cited references fail to render the present invention obvious

Particularly, in comparison with the present invention, Kim generates the same scrambling codes as used for transmitting data, extracts channel data, complex-conjugates the

generated scrambling codes and the channel, multiplexes the complex conjugated scrambling code with the extracted signal, eliminates the scrambling code, and demodulates and receives the data. However, the present invention identifies the indicator bit in the decoded data stream, eliminates the identified **operator** bit in the decoded data, demodulates and receives the data. As mentioned above, Kim generates the scramble code used for transmitting data, eliminates the scrambling code by using the generated scramble code, demodulates and receives the data, but the present invention identifies the **operator** bit in the decoded data, eliminates the identified indicator bit, demodulates and receives the data.

As mentioned above, the construction of the present invention is clearly different from that of Kim. Specifically, since the present invention does not involve the construction of generating the scramble code and complex-conjugating the generated scramble code, the construction of the present invention is far less complicated than that of Kim. Accordingly, the main technical features of the independent claims 15 and 17 for receiving data in the present invention are not disclosed anywhere in Kim and Yoshida. Thus, the Applicant respectfully submittedv that the rejection of Claims 15-18 is incorrect.

Claims 2-3, 5-6, 8-10, 12-14, 16 and 18 depend from independent Claims 1, 4, 7, 11, 15 and 17. Therefore, without conceding the patentability per se of dependent Claims 2-3, 5-6, 8-10, 12-14, 16 and 18, they are believed to be patentably distinguished over the combination of *Onggosanusi, Kim* and *Yoshida et al.*, based on their respective dependency from independent 1, 4, 7, 11, 15 and 17. Accordingly, reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection of Claims 1-18 is respectfully requested.

In view of the above, it is believed that the subject matter of claims 1-18 is unobvious in view of the cited references and the claims are in condition for allowance. Thus, it is respectfully requested that the Examiner withdraw the 35 U.S.C.§103(a) rejection of Claims 1-18 and reconsider said claims for allowance.

Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any remaining matters, the Examiner may contact Applicant's attorney at the number given below.

Respectfully submitted,

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